

# SHOCK INDEX AS PREDICTOR OF OUTCOME IN PATIENTS WITH SEPSIS

## A COHORT STUDY

### ABSTRACT

#### BACKGROUND

Severe sepsis has substantial clinical and financial, challenges. Previous studies have shown that early identification of sepsis is associated with better outcome. However limited resources are a major obstacle in early identification of sepsis patients. This is also complicated by the various etiologies responsible for sepsis and the heterogeneity presentations. Shock index gains significance in this context as it is an easily calculable score which can even be measured by non-medical personnel.

#### AIM

To study the disease spectrum of patients with suspected sepsis and assess the usefulness of shock index in predicting the clinical outcome.

#### OBJECTIVES

##### PRIMARY OBJECTIVE:

To assess whether in patients with suspected sepsis, shock index is a good predictor of clinical outcome.

## SECONDARY OBJECTIVES:

Role of shock index in predicting ICU requirement.

Shock index in predicting hemodynamic support.

Shock index in predicting ventilatory requirement.

Shock index and its relation to duration of hospital stay.

Correlation of shock index with other mortality predictors (lactate levels, initial SOFA score and q SOFA score).

Usefulness of shock index across the various etiologies for sepsis.

## METHODS

We conducted a cohort study of patients with suspected and/or confirmed infection fulfilling at least 2 SIRS criteria who presented to the emergency department and were subsequently admitted in the medical wards or in the medical ICU. This was a single center study done at Christian Medical college, Vellore, a tertiary care hospital primarily catering to the middle and low income group patients from all over India, predominantly the south Indian and the north eastern states. From the initial emergency department documentation of the heart rate and systolic blood pressure, shock index was calculated. Similarly SOFA score, q SOFA scores were calculated and the initial lactate levels were noted. Usefulness of shock index in predicting the in-hospital mortality was assessed and

this was compared with other outcome predictors like SOFA score, q SOFA score and lactate.

## FINDINGS

Between January 1<sup>st</sup> 2016 and June 30<sup>th</sup> 2017, 575 patients fulfilling the inclusion criteria were enrolled into the study. Diabetes was identified as a major risk factor, present in 34.6% of patients. Majority of culture proven infections were caused by gram negative bacteria. E.coli was the major gram negative bacteria and staphylococcus aureus was the main gram positive bacteria. Urinary tract (24.7%) and lungs (15.8%) were the major source of sepsis. Scrub typhus (16.1%) and H1N1 (7.3% ) accounted for majority of culture negative infections. 70.6% of the study population had shock index values greater than equal to 1.0 at the time of presentation to the emergency department. Patients with higher shock index at the time of admission (shock index greater than or equal to 1.0), had higher in-hospital deaths (37.68%) than patients with shock index less than 1.0 (7.69%), with an absolute difference of 29.99% and p value less than 0.001. This effect of shock index on mortality was irrespective of the etiology of infection. Similarly shock index values greater than 1.0 was also associated with higher rates of ICU admission (48.0% versus 11.6%) , greater need of inotropic (51.47% versus 1.77%) and ventilator support (58.37% versus 19.52%) during the initial 48 hours of hospital stay. Performance of shock index was comparable with that of SOFA, q SOFA and lactate.

## CONCLUSION

Higher shock index (greater than 1.0) values at the time of presentation was associated with higher mortality rates, higher rates of ICU admission and greater need for ventilator and inotropic support. It also performed well as a mortality predictor across all the infectious etiologies. Hence it can be used as a triaging tool for septic patients, especially in the resource poor settings.

Keywords: Shock index, mortality predictor, sepsis, q SOFA, lactate, SOFA score, emergency department, ICU.